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WEEKLY STATION REPORTS

OF THE DIVISION OF

DRY LAND AGRICULTURE

BUREAU OF PLANT INDUSTRY

U. S. DEPARTMENT OF AGRICULTURE

1937

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REPORT FOR THE MONTH OF NOVEMBER, 1937

HAVRE:

November was characterized by slightly below normal temp eratures, however no unusually low readings occurred, the range being from 64° on the 9th to -1° on the 18th. Precipitation was below normal, but the snowfall amounted to 6.8 inches. The month was not especially windy, with the exception of a strong blow during the night of the 8th.

Favorable weather early in the month permitted raking and burning of weeds in the experimental field, except on projects where the growth is allowed to remain. The general appearance of fall sown small grains and crested wheatgrass is the best in several years. Farm work consisted chiefly of hauling hay into the beef cattle winter feeding lots and chopping Russian thistles for the same purpose. Various repairing was also done. The station cattle herd was removed from the Bear Paw Mountain lease late in November and will be wintered at the station.

A WPA crew has virtually finished a machine shed and shop, the structure being of brick, with a slate roof, 180 by 32 feet, materials being salvaged from abandoned former military post buildings. Considerable progress has also been made in cleaning additional land, later to be used for alfalfa.

Station visitors included R. D. Mercer, Extension Agronomist, M. P. Hansmeier, Extension Conservationist, L. F. Gieseker, in charge of the Soil Survey, Bozeman, Mont.; Ben Daggett, Hill County Extension Agent, Havre; O. L. Anderson, Project Manager, and E. C. Coey, Agronomist, Soil Conservation Service, Culbertson, Mont.; E. H. Aicher, State Coordinator, SCS, Bozeman; and Wilkie Collins, Jr., Agronomist, SCS, Rapid City, S. Dak. This group met for a full day conference at the station, discussing tillage practices, regrassing methods, and dry-land farming systems.

Maximum temperature, 64°; minimum, -1°, precipitation, 0.28 inch; snowfall, 6.8 inches.

JUDITH BASIN:

Judith Basin prospects were more encouraging with November, the third month in the calendar year, coming within 0.02 inch of equaling the 28-year monthly average. Several of the small snows during the month were lost by heavy winds sweeping them from stubble, plowed lands, and emerged fall grains. The last and largest snow of the month has not blown off, and the past few days, being somewhat warmer, have allowed much of it to melt and go into the soil.

During the third week of the month a cold spell which was general over the northwest gave us our only subzero temperatures, -1°on the 18th and -7° on the 19th.

Although there is a limited moisture reserve, winter grains appear to be in fairly good condition. The growth isn't as abundant as normal, but good stands are in evidence to date.

Maximum temperature, 62°; minimum, -7°; precipitation, 0.62 inch.

HUNTLEY:

Average wind velocity and temperatures for the month were below normal. Precipitation, all in the form of snow, was 58% of normal.

Climatic and soil conditions were favorable for field work during the first half of the month, but during the last half the soil was usually too wet for tillage. Precipitation in October was sufficient to soften up the clods on fall plowed land, and during the last month these plots were harrowed and leveled. Additional field work consisted of hauling in corn fodder and raking and burning weeds.

Fall-sown grains continue to look well on all plantings. During the coldest days of the month the ground was covered with snow which protected the young plants and also prevented the soil from freezing. Moisture resulting from melting snow all entered the soil without any run-off.

At the close of the month the ground was covered with 4 inches of snow which was beginning to melt slowly.

Maximum temperature, 67°; minimum, -3°; precipitation, 0.45 inch.

SHERIDAN:

Temperatures for November were about average for the month. Wind movement was slightly under the average, and precipitation just equalled the 20-year average for the station.

The month was fairly open, and no feeding of livestock on the station was necessary until the middle of the month. Under ordinary ranch conditions no feeding was necessary throughout the month. There was one light snow about the middle of the month, but this soon disappeared. Snow occurred again from the 28th to the 30th, and the month ended with about a 3 inch cover on the ground. Temperatures were below zero on only 1 day, the 19th.

Field work was possible until about the middle of the month. Russian thistles were cleared from some land, and some work was done with the damming lister where a comparison might be obtained with land left untouched. Only miscellaneous work about the buildings was possible over the last half of the month.

Maximum temperature, 65°; minimum, -10°; precipitation, 0.76 inch.

MANDAN:

The month of November on the whole was near to normal. The total precipitation for the month was 0.34 inch, compared with 0.58 inch, the 60-year normal. The maximum temperature was 65° on the 9th. The minimum temperature was -8° on the 21st.

During the past season considerable interest has been aroused in connection with the prediction of wheat production on the basis of available soil moisture at seeding time. Without doubt Kansas Bulletin 273 by Hallsted and Mathews, "Soil Moisture and Winter Wheat with Suggestions on Abandonment", has been largely responsible for the interest.

In order to meet inquiries prompted by a desire for this kind of information, use of a formula submitted last May by Mr. Cole for predicting yields of spring wheat, has been made in connection with continuous spring plowed wheat in our main field. The formula used is as follows:

$$\text{Yield} = \frac{\text{(available water -6)}}{0.25}$$

In this formula, as we have used it, "available water" consists of the available water in the surface 5 feet of soil at seeding time, plus the normal precipitation for May, June, and July, for the 23 years, 1915-37. The available water was determined by deducting the normal point of field reduction (permanent wilting point) from the actual moisture content. In selecting the data to represent available water, no differences less than 0.10 inch were used.

In the following table is presented a comparison of wheat yield expectancy with actual yield, accompanied by the deviations from the normal precipitation for the period May, June, and July. It is gratifying to note how well the deviations of precipitation account for the differences between yield expectancy and the actual yield.

Wheat yield expectancy based on available water in the soil at seeding time and normal precipitation for the months, May, June, and July, compared with actual yield and deviation from normal precipitation for May, June, and July.

Year	Yield expectancy	Actual yield	Deviation from normal precip.	Year	Yield expectancy	Actual yield	Deviation from norm. prec.
	Bu.	Bu.	Inches		Bu.	Bu.	Inches
1915	18.4	30.5	9.72	1927	10.8	22.2	2.96
1916	24.3	19.2	-.57	1928	14.8	15.5	3.75
1917	25.5	15.3	-3.57	1929	26.1	13.8	-3.19
1918	24.1	12.7	-2.46	1930	17.6	10.2	-1.93
1919	11.0	7.5	-2.14	1931	17.7	13.2	.05
1920	9.2	1.5	-1.81	1932	21.0	26.0	.65
1921	10.0	1.8	-0.81	1933	18.8	0	-2.25
1922	19.0	19.5	0.59	1934	10.2	1.5	-3.01
1923	17.5	8.3	-0.82	1935	15.2	22.7	2.13
1924	17.2	21.5	-0.02	1936	12.3	0	-7.59
1925	19.2	18.5	0.79	1937	10.4	(11.8) 1/	0.71
1926	6.2	1.0	-2.26	Average	16.3	12.8	

1/ Yield estimated. Owing to serious damage to MC-A-Wheat main field in 1937 the actual yield (4 bu.) did not truly represent the treatment. The yield presented is 86 percent of the average yield of wheat after oats in rotation 9 in the triplicate series. The percentage relationship represents that of the average yields from these two treatments during the period of experiment.

DICKINSON:

The early part of November was mild, but the last of the month was much colder with a minimum of -15° on the 19th. The mean temperature of 17.3° was 11° below normal. Precipitation was slightly above normal. The ground was covered with snow about half of the month, but about half of the ground was bare at the end of the month. During the mild days early in the month the soil was so dry that fall seeded grains and grasses made no growth.

A small WPA crew is working on the station, mainly on roads. Some trees were dug and the dead trees piled as a snow fence along the Western Yellow pine where it is on the outside of the windbreak. A good many of the lower branches of this pine were killed by tip moth larvae a few years ago, so the trees are open beneath and the wind sweeps most of the snow on through. In spite of this, the Western Yellow pine has survived better than any other species in the old plantings. Only a very few have died during recent severe droughts.

Late fall seeding of grasses and some sweetclover for compliance under the 1937 Agricultural Conservation Program continued on farms in the district into November. Most of this was seeded in grain stubble or on weedy uncropped land. Crested wheatgrass seeded on the station on October 26, 1936, on uncropped land covered with a thick, short growth of Russian thistle produced excellent stands from both furrow and common drill seedings. Although this was seeded in a bone dry soil, the weeds held enough snow to permit the seedlings to become well rooted after germination in early April. In late May the soil became so dry that many of the thistle seedlings turned yellow and died, yet the grass survived and made a fair growth during the summer and greened up a little in the fall. Spring seedings of grasses in both 1936 and 1937 were nearly all failures as a result of drought and grasshoppers.

Maximum temperature, 66°; minimum, -15°; precipitation, 0.53 inch; snowfall, 4.5 inches.

BELLE FOURCHE:

The first two weeks of November were mild and dry, but the last half of the month was generally cloudy, unsettled, and comparatively cold. Small amounts of precipitation, mostly in the form of snow, were received almost daily from November 15 to 30, but the total precipitation during the month was only about 50 percent of the average for November. No wide extremes in temperature occurred, and there was only one day in which the minimum temperature was lower than 5°. The mean

temperature was 31°, which is 2° below normal. Strong winds were of frequent occurrence, and some soil blowing took place on November 12, when the average wind velocity was 30 miles per hour from 11:00 a.m. to 1:00 p.m., and 22.2 miles per hour for the 24-hour period. This is the highest daily average wind velocity of record for 10 years.

The total precipitation for the year to date is 18.12 inches, which is 2.76 inches above the average for the 11 months. Only 0.50 inch precipitation has been received since the heavy rains early in September, and the soil on all continuously cropped spring wheat plots is much drier now than at the time of harvesting spring wheat on July 31. Soil samples taken November 22 showed spring plowed wheat ground to be quite dry to a depth of 3 feet or more, owing to a heavy growth of Russian thistles and volunteer grain during the fall, but some available moisture remained in the first 2.5 feet of soil on other cultural treatments.

Growth of fall grain was checked and volunteer spring grain was killed by subzero weather on November 19. Fall grain is in excellent condition on summer fallow, but it is beginning to show the effect of lack of moisture on other cultural treatments.

Maximum temperature, 69°; minimum, -3°; precipitation, 0.24 inch.

ARCHER:

The fore part of the month was mild, but the last half was colder with considerable precipitation. On November 18 a snow storm, totalling 0.18 inch of precipitation, occurred. This was followed by rain on November 21 and 22. The snow did not blow and was melted by the rain. The surface soil moisture, occasioned by the precipitation recorded October 16, added to the November moisture gives the surface soil a goodly supply with which to enter the winter.

On November 12 a severe wind storm occurred. The average hourly wind velocity from 8:00 a.m. to 4:20 p.m. was 39.9 miles. While but little soil shifting occurred, clouds of dust were in the air. It is hoped that with the better supply of soil moisture than has prevailed for some years, the soil shifting will be reduced.

As a whole the winter cereals in this section give promise. That which emerged in the early fall has suffered from rabbit grazing, but that which emerged since October 16 is in good condition but is not growthy. At present the soil is frozen. This condition prevents the rabbits from digging up the plants. By shooting and using poison baits a large number of rabbits have been killed in the vicinity of the station.

The experiment in which corn is harvested by lambs was brought to a close this morning. The lambs made a very clean harvest job, only a few stalks remaining in the field. Out of the 60 lambs in the experiment one wether died, the cause of death being urinary calculi.

Maximum temperature, 64°; minimum, -8°; precipitation, 0.57 inch.

NORTH PLATTE:

November weather was dry, and the temperature normal. A severe dust storm occurred on the 13th. This caused considerable damage to late seeded wheat on light soils, and to fences that were not able to stand the pressure of piles of Russian thistles and kochia.

Livestock has remained in good condition, but the outlook is not promising considering the shortage of feed and the long months ahead until any is grown. While feed prices are lower than last year, an added year of crop failure has left the average farmer in poorer position to buy. As a result, livestock will be carried through on the shortest possible rations.

Maximum temperature, 71°; minimum, 4°; mean, 36.6°; precipitation, 0.06 inch.

AKRON:

The month produced precipitation as follows, all measurable amounts as snow: Traces on the 6th, 15th, 18th, 20th, and 29th, 0.24 on the 21st, and 0.08 on the 25th.

The first cold spell reached a minimum of 18° on the 8th. Another cold spell reached a minimum of -1° on the 19th.

A northwest wind maintained a 24-hour average velocity of 17.9 miles per hour on the 12th. This was the first wind of a comparatively quiet fall.

Late fall plot work was completed at about average time near the 10th. Other work was the grinding of feed, and the weighing and placing of it in the self-feeding bins of the three lots of fattening hogs. H. B. Osland of the State College came down to supervise the regular monthly weighings on the 24th. Other work was the fanning of seed grains, and the preparation of office records.

Maximum temperature, 74°; minimum, -1°; precipitation, 0.32 inch, 0.18 less than the average for the month.

COLBY:

November was generally a pleasant fall month. There was only 0.09 inch of precipitation, which fell in the form of a shower turning to snow. The temperature averaged slightly below normal. The first killing frost of the fall occurred on the morning of the 3rd. This is the latest date of the first killing frost of the fall on record here. There was no very cold weather during the month, except for nearly a week just after the middle, when the thermometer dropped to 4° one morning and to below 20° on several mornings. The wind velocity was about normal, with only two days when it was very windy and dusty with some soil blowing.

The field work has been completed on the D.L.A. plots. Lister furrows have been run down each alley between the plots and along the edges of all the roadways. The fallow plots which were not seeded to a crop this fall were ridged with a furrow drill to guard against blowing. Winter wheat generally covers the ground on the fallow plots, but only in spots on the others. The stands on some of the plots are spotted,

due to the seed bed drying out after seeding before the seed germinated, and also due to grasshopper injury near trash or stubble. Most of the seed that did not germinate immediately after seeding came up following the mid-October rain, but is not making much of a showing yet.

Maximum temperature, 75°; minimum, 4°; precipitation, 0.09 inch; snow, 0.3 inch; precipitation, 50-year average, 0.58 inch; precipitation, January to November, 14.65 inches; 50-year average, 16.91 inches.

HAYS:

Generally mild and quiet weather prevailed. "Indian Summer" type of weather was the rule. The quietness was broken only about five times on as many different days by wind sufficiently heavy to raise and carry considerable dust, but these could not be called dust storms. Dust raised from some local fields, but thus far no soil blowing has taken place.

The growth of wheat on the project is about normal, none of it heavy, but satisfactory. It does not cover the ground, but the plants have several leaves and the plots look green from the road when looking down the drill rows.

In this county, and for most part, the adjoining counties, there is rarely found a field that does not have a good stand of wheat. The growth ranges from heavy on early seeded fallow to light on late seeded fields. The average growth is about normal, the plants are well established, and some pasture is available.

The temperatures ranged between a maximum of 81° and a minimum of 6°. The mean temperature was 40.6°. Total precipitation for the month was 0.40 inch, all of which occurred in the form of snow on four days.

GARDEN CITY:

Up to and including November 30 the precipitation for the year amounted to 7.92 inches, which is the second driest period on record. The normal for the period is 17.22 inches. Only two traces of moisture fell during the month of November, and they came in the form of snow. Average temperatures were a little below normal, and the average wind velocity was nearly normal. Four days during the month were recorded as dusty, but none was severe.

Wheat seeding was delayed until the last part of this month, due to the lack of moisture. The seedbed is very dry and powdery and will probably blow readily unless sufficient moisture is received to germinate the seed and to bind the soil particles together. There is practically no moisture in the continuously cropped plots, but the fallow plots have at least 2 feet of moist soil.

Other field work consisted of weighing sorghum stover and cowpeas, doing late fall plowing and listing, and taking soil samples on M.C. wheat plots A,B,C, and D. A new project was staked out on virgin sod. It consists of 35 plots, 32 of which are one-fifth acre and three of which are 250 by 84-1/3 feet. The purpose of the project is to compare basin

listing with ordinary listing on the contour and up and down the slope, and also with one-waying. The crops to be grown are milo and wheat. Wheat will be grown on fallow, and the milo will be grown continuously in 44-inch and 88-inch rows and also on fallow.

Maximum temperature, 77°; minimum, 7°; precipitation, trace.

TUCUMCARI:

Fall work has been practically completed under very favorable weather conditions. Threshing was completed yesterday, and various last-minute jobs will be performed this week.

Wheat on the plains south of Tucumcari is seriously in need of moisture. Fall plowing on the station showed abundant moisture, but the plains locality failed to receive a heavy rain that occurred at Tucumcari in mid-October.

Range grass, where moderately grazed, cured well this fall, and livestock are in good condition.

November precipitation of 0.06 inch brought the total for the year to date to 16.11 inches slightly above normal for the period. Temperatures were moderate, and the mean of 46° was only slightly below the long-time November mean. The absolute maximum was 79°; minimum, 13°. Wind velocity was slightly above normal, but only two or three days were unusually windy.

Sorghum yields have not been figured, but it is believed they will approximate one-half the long-time average. Precipitation for the growing season was above normal, but during a 90-day period following June 6 only 1.82 inches fell. This total occurred in 12 showers, only one of which exceeded 0.30 inch.

DALHART:

The weather for the month was rather open fall weather with no seasonal extremes. The mean temperature for the month was 42° which is 1° below normal. The maximum temperature was 75° on the 6th, and the minimum was 12° on the morning of the 19th. The first killing freeze was on the morning of the 16th. The precipitation for the month was 0.15 inch in the form of snow which fell without wind and melted into the ground before sufficient wind came to disturb it. This furnished just sufficient moisture to meet the other moisture in the soil. While the wind velocity was below the monthly average this was chiefly due to the fact that there were 5 very calm days during the month. Only two days gave much dust or soil blowing; one of these was on the 7th, and the other was on the night of the 26th. The latter was characterized by a very strong wind, and those that were caught out in it claimed that the dust was severe. The yearly precipitation to the end of November is 14.16 inches, which is 3.05 inches below normal. All monthly precipitation has been below average except May.

Field work during the month consisted largely of normal fall work and was chiefly heading of grain sorghums, threshing, recording weights, and recleaning. There still remains

one day's threshing, 3 days of stover weighing, and 2 day's plowing. For inside work there still remains several days of nursery threshing, seed threshing, and recleaning.

Winter wheat and rye continue to look good for late planting. There is some rabbit injury, but apparently there are not nearly so many rabbits this year as last year.

Yields of grain sorghums, while erratic on some plots, were for the most part seasonal. Some averages are given here which show the yields of the different cultural treatments as affected by the moisture distribution and other climatic factors:

Crop, year, period	Yield in bushels per acre					Ppt. Oct.1-Sept.30
	Spring plowed	Fall plowed	Fallowed	Listed	Ave.all plots	
Milo						
1937	18.1	7.5	13.0	15.2	14.2	13.56
29-yr.ave.	20.9	22.0	30.5	16.1	22.0	17.78
Kafir						
1937	22.2	10.1	18.3	17.0	17.6	
29-yr.ave.	18.0	19.7	24.4	16.2	19.4	

BIG SPRING:

Weather conditions during the month of November were, for the most part, very favorable for harvesting crops. There were two rainy days and a few cold ones, which delayed picking of cotton for a few days, but otherwise there have been no interruptions.

The rainfall for the month was 1.58 inches, which is 0.47 inch above the normal for this station. The first killing frost of the season occurred November 18; about 10 days later than normal. The minimum dropped to 22°, which was unusually low for the month of November. With the exception of possibly some late planted cotton which may not open, the freeze did little or no damage. All feed stuff in this area was mature, and most cotton was far enough advanced to open afterwards.

This county has ginned something over 35000 bales up to date, which is more than was ever produced in the county before, and it is estimated that there are between 5 and 10 thousand bales more to be ginned.

Station work has consisted mainly of harvesting and threshing sorghums, picking cotton, and harvesting and stacking peanuts. All sorghum threshing from the plots was completed November 30.

Forty head of Hereford calves were received for the feeding experiments November 6, and have been on a preliminary feed for the past three weeks.

Maximum temperature, 86°; minimum, 22°; precipitation, 1.58 inches.

LAWTON:

Although the minimum temperature for the month of November was only 19°, the month as a whole, was rather cold,

averaging 4.4° below normal. A few days of high wind velocity were recorded. The monthly precipitation of 1.06 inches was 0.75 inch below normal. A mere trace of snow was observed once during the latter part of the month.

Small grains made but little late fall growth, and fall pasturage is pretty well used up. Station plots of small grain are in pretty good winter condition.

Freezing temperatures each night since November 15 caused the late, well-developed cotton bolls to start cracking. It is quite probable that considerable late cotton of this type will be snapped in December or January and brought to the gins. However, the low price of cotton does not offer much encouragement to such harvesting. An additional picking on the station plots remains to be determined.

WOODWARD:

Except for a brief period of low temperatures, temperatures have been moderate and equable. There have been several disagreeably windy days, but in the main winds have been moderate. The month has been very pleasant.

The first killing freeze occurred November 16. Due to its occurring so late, much sorghum grain was matured that otherwise would have been worthless.

There has been practically no precipitation since October 12, and the remark is often heard "We're getting where we need moisture". However, the heavy precipitation in September and October sank well into the 3rd and 4th feet, and wheat, having made only a moderate growth, has not drawn heavily on it. Where wheat has been pastured the surface of the soil is very dusty, as it is in stalk fields. A hard wind easily starts a dust storm. But with wheat as securely anchored as it is and with the abundance of moisture in the soil, there seems no possibility of serious soil drifting that cannot easily be controlled.

On the station all fields that are to be planted to grass or alfalfa next spring were planted to sorghum or Sudan grass and are well covered. Last year alfalfa was fall planted with sorghum as a nurse crop very successfully. This year sorghum stifled alfalfa.

The past summer took serious toll of trees, and a great many of them are being pulled. This is for several reasons, one being to get rid of dead or small and stunted trees. Another is to give surviving trees not only more room from which to draw moisture, but more room to spread their branches and gain impressive size and good form. A dozen trees often do not make as good a showing as two or three, or even one, in the same space.

On the station, work during the month consisted largely of harvesting sorghums, cleaning grass seeds, picking tree and shrub seed, and building grape trellis. Considerable nursery stock was dug and packed for shipping. Trapping gophers and taking soil samples were among other routine activities.

Maximum temperature, 77°; minimum, 13°; precipitation, 0.03 inch.

PENDLETON:

Precipitation during November was 2.43 inches, which is considerably above the normal of 1.33 inches. A measurable amount of precipitation occurred on 17 days during the month, with 0.47 the most in any 24-hour period. Considerable seeding was done by farmers during the month. About 70 percent of the wheat acreage in this section is fall sown this year; in 1936 only about 25 percent of the wheat acreage was fall sown. On the station all the fall sown wheat has emerged with good stands. Temperatures during November were above normal. Chrysanthemums, delphiniums, asters, larkspurs, and veldt daisies are still flowering in the garden.

Maximum temperature, 67°; minimum, 26°; precipitation, 2.43 inches.

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